

REMARKS

The last Office Action has been carefully considered.

Claims 1 and 9, 6 and 14, 7 and 15, as well as 8 and 16 are rejected by the Examiner. The Examiner states that these claims are rejected as being unpatentable over Lyons et al in view of Kikuchi and the IEE Proceedings-C "Role and Objectives of Control for Wind Turbines". From Lyons patent, a wind energy system is allegedly known with a wind rotor, rotor blades, and a generator connected to the rotor. This system can be shut off when needed. However, this patent - according to the Examiner - does not disclose adjusting the angle of the blades.

The Examiner further indicated that it is known from Kikuchi to vary the angle of the rotor blades as a function of the wind velocity in order to prevent damage to the rotor blades. In the Examiner's opinion, it is furthermore known from IEE-Proceedings-C to operate wind turbines in the interval 5 m/s to 25 m/s and to continuously monitor the turbine so as to keep the power output at a constant level of the nominal power, up until the moment that a maximum wind speed is reached at which the turbine is shut

off. According to this state of the art the energy generated is reduced by varying the pitch of the rotor blades.

In view of the above the Examiner concluded that it would have been obvious to a person skilled in the art at the time the invention was made to come up with a wind energy system that combines the teachings of the patents to Kikuchi, Lyons, and the IEE-Proceedings.

Applicant respectfully disagrees with this position for the following reasons.

According to the pre-characterizing part of claim 1 of the invention, the system is shut down above a shutoff speed of roughly 23 m/s. Figure 4 of the invention illustrates how the shutoff speed is defined. It is the maximum wind-speed up to which the wind energy system is designed to be operational. The system is disconnected from the power line above the shutoff speed.

It is apparent that at this point a clear-cut definition of the different characteristic wind speeds be made for a correct understanding of the invention and its differences from the prior art:

- shutoff speed: That wind speed at which a wind energy system that has no pitch control or the like to influence the rotor blades would have to be shut off, i.e. would have to be taken out of service.
- survival speed: That wind speed which defines the maximum permissible wind speed which the over-all construction of the system is designed to withstand. It can be above the shutoff speed (its means of regulating rotor blade pitch or the like are available) or it can be numerically identical with it. Above this wind speed any wind energy system, even one that is equipped with pitch control, must be taken out of service.
- limit speed: That wind speed lying under the shutoff speed at which the power output of the wind energy system is deliberately/arbitrarily reduced.

Both the shutoff speed and the survival-speed are dependent among other parameters upon the mechanical design of the energy plant's structure. However, if the design in accordance with today's state of the art technology is assumed, the shutoff speed assumes a fixed value of roughly 23-25 m/s. This value is known to a person skilled in the art from text books such as the IEE-Proceedings cited by the Examiner as being virtually a fundamental constant.

Referring to the graph provided in the attachment it becomes apparent that the shutoff speed in accordance with the invention corresponds to the maximum wind-speed at which the wind energy system will deliver energy to the power line. The decisive distinction to the prior art - especially to the teachings of the IEE-Proceedings - resides in the fact that the choice of numeric value for the limit speed according to claims 6 to 7 of the invention is 16 m/s. On the contrary, the cited IEE-Proceedings teaches to operate the system at maximum nominal output power up to 25 m/s.

The attached graph illustrates the situation as follows:

The graph corresponds to the display of the invention's Figure 4 and the IEE-Proceedings-C's Figure 3 in the same graph. The curve labeled "IEE-Proc's-C" corresponds to the prior art approach whereas the curve labelled "invention" shows the inventive idea. Additionally, the wind probability density function for List on the German island Sylt in the North Sea is displayed in the graph. List is a site in central Europe. The invention's description makes reference to wind conditions at central European sites on page 3, first paragraph, line 9.

This wind distribution has been published for example by the research team for wind energy at the University of Münster, Germany. The

reference is attached to this document. Therefore, the information compiled in the graph by no means exceeds the scope of the original disclosure of the application.

The display of both the conventional approach as well as the approach according to the present invention thus illustrates that the essence of the invention resides in choosing a limit speed of e.g. 15m/s (as disclosed on page 7, second paragraph, line 4 of that paragraph) at which the power output of the system is deliberately system capable of being operated at nominal output up to the shutoff speed of e.g. 25m/s (cf. IEE Proceedings-C, Fig. 3). It is also apparent from the graph that the shutoff speed is chosen to be 23m/s, corresponding approximately to 25m/s as put forth in the IEE-Proceedings. The advantage of the approach described in the present invention is that the design of the plant can be made to match up with these considerably lower shutoff speed and limit-speed. This results in a favorable effect on the manufacturing costs of the plant, as put forward on page 3, line 4, as well as page 4, 5 bottom lines of second paragraph of the description to the present invention.

Thus, the object of the invention is to deliberately limit the usable range of wind-speeds in view of the wind statistics for the intended

operating sites in central Europe. This is contrary to the prior art's strive towards making wind plant's fit for even higher wind speeds.

In order to better emphasize this inventive idea, claim 1 has been amended. It now included the special numeric choice of 16m/s for the limit speed which was formerly listed in claim 7. This should adequately underscore the inventive step involved in moving from the IEE-Proceedings-C's teachings to the present invention. The IEE-Proceedings-C include no incitation whatsoever to decrease the maximum wind-speed of 25m/s at which the plant procedures nominal power.

With reference to claims 2 through 4 as well as with reference to the corresponding method claims 10 through 12 the Examiner states that the features given therein would have been obvious to a person skilled in the art when combining the plants described in the patents of Lyons, Kikuchi and in the IEE Proceedings-C with the method disclosed in DiValentin's patent. In this context the Examiner makes special reference to claim 3 of DiValentin's patent as well as to the abstract.

Applicant respectfully disagrees with this assessment because, the teachings of DiValentin concern a control around a limit speed which is

defined in the run-up phase of the plant, i.e. at increasing wind-speeds starting from very small or vanishing wind-speeds. It can be inferred from Figure 1 - this figure was not cited by the Examiner - that this patent relates to the power-up phase up to the constant nominal power up to the point D. This nominal power is to be kept constant up to the greater wind-speed at point E.

In contrast to this approach, the present invention relates to a control around a limit speed as defined above which corresponds rather to point E of DiValentin's patent. As can furthermore be seen in DiValentin's Figure 1, the patent's object is to make the power generation more efficient at wind-speeds below point D, i.e. before the steady state at nominal power is reached.

In contrast to that, the present invention relates to the behavior around point E in DiValentin's Figure 1. Consequently, it cannot be recognized where DiValentin's teachings contain a suggestion that at the time the invention was made would have lead one having ordinary skill in the art to employ a control strategy which keeps the power output at a constant level below a limit (current claim 2), to reduce the power output above a limit speed (current claim 3), and finally to maintain the power and rpm-value

constant below the limit speed and to linearly decrease these parameters above the limit speed (current claim 4).

The only similarity between the present invention and this patent is of a purely formal nature in that both systems incorporate a control method for controlling the system below and above a limit speed. However, this limit-speed is defined completely differently in each case - i.e. in the patent the point at which the maximum torque acts upon the rotor; in the present invention the point at which the overall mechanical endurance limit is approached.

The claims in the present application were rejected as obvious over the teachings of the references. As explained herein above, the present invention is defined in the above-analyzed claims is not disclosed in the references and can not be derived from them as a matter of obviousness. In order to arrive at the applicant's invention from the references, the references have to be fundamentally modified by including into them the new features proposed by the applicant. However, it is known that in order to arrive at a claimed invention, by modifying the references the cited art must itself contain a suggestion for such a modification.



This principle has also been consistently upheld by the U.S. Court of Customs and Patent Appeals which, for example, held in its decision in re Randol and Redford (165 USPQ 586) that

Prior patents are references only for what they clearly disclose or suggestion; it is not a proper use of a patent as a reference to modify its structure to one which prior art references do not suggest.

Definitely, the references do not contain any hint or suggestion for such modification.

As explained herein above, the present invention provides for the highly advantageous results which can not be accomplished by the constructions and methods disclosed in the references. It is well known that in order to support a valid rejection the art must also suggest that it would accomplish applicant's results. This was stated by the Patent Office Board of Appeals, in the case Ex parte Tanaka, Marushima and Takahashi (174 USPQ 38), as follows:

Claims are not rejected on the ground that it would be obvious to one of ordinary skill in the art to rewire prior art devices in order to accomplish applicants' result, since there is no suggestion in prior art that such a result could be accomplished by so modifying prior art devices.

In view of the above presented remarks and amendments, it is believed that the claims currently on file should be considered as patentably distinguishing the present invention from the prior art.

Reconsideration and allowance of the present application is most respectfully requested.

Should the Examiner require or consider it advisable that the specification, claims and/or drawings be further amended or corrected in formal respects in order to place this case in condition for final allowance, then it is respectfully requested that such amendments or corrections be carried out by Examiner's Amendment, and the case be passed to issue. Alternatively, should the Examiner feel that a personal discussion might be helpful in advancing this case to allowance, he is invited to telephone the undersigned (at 631-549-4700).

Respectfully submitted,



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